

# NASA TECH BRIEF

## *Goddard Space Flight Center*



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### Improved Thermally Conducting Electron Transfer Polymers

#### The problem:

Currently, electronic modular components encapsulated with existing polymeric materials do not dissipate enough heat.

#### The solution:

A newly discovered group of polymers that display excellent thermal conductivity can be used to allow rapid passage of heat. A variety of these electron-transfer polymers can be formed.

#### How it's done:

A group of polymers is prepared from phenol, hydroquinone, and formaldehyde. The normal phenol/formaldehyde polymers have a thermal conductivity in the range of  $6$  to  $7 \times 10^{-4}$  cal/cm-sec-°C. When hydroquinone is added a new polymer is formed. The thermal conductivity of this new compound is in the range of  $1$  to  $2 \times 10^{-3}$  cal/cm-sec-°C which is an improvement by a factor of 4 over the previous type.

Other polymers can be constructed using a multitude of different compounds. All of these new products exhibit a thermal conductivity at least twice the magnitude of that of known polymers. They are very useful as coating materials for electronic components.

#### Note:

Requests for further information may be directed to:  
Technology Utilization Officer  
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Reference: TSP72-10291

#### Patent status:

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